

# **Wahleach Project Water Use Plan**

## **Monitoring Program and Physical Works**

**Annual Report: 2014**

**Implementation Period: February 2013 to January 2014**

- **WAHMON-1 Lower Jones Creek Fish Productivity Indices**
- **WAHMON-2 Channel Stability Assessment**
- **WAHMON-3 Herrling Island Sidechannel Chum Spawning Success Monitoring**
- **WAHWORKS-1 Boulder Creek Diversion Bypass**
- **WAHWORKS-2 Wahleach Reservoir Fertilization Program**
- **WAHWORKS-3 Lower Wahleach (Jones) Creek Channel Enhancement Project**

**For Water Licences 119711, 119709 and 119710**

**February 28, 2014**

## **BC Hydro Wahleach Project Water Use Plan Monitoring Programs and Physical Works Annual Report: 2014**

### **1 Introduction**

This document represents a summary of the status and the results of the Wahleach Project Water Use Plan (WUP) monitoring programs and physical works to January 31, 2014, as per the Wahleach Order under the *Water Act*, dated January 25, 2005. There are three monitoring programs and three physical works.

### **2 Status**

The following table outlines the dates that Terms of Reference (TOR) for the Wahleach Project WUP monitoring programs and physical works were submitted to and approved by the CWR.

**Table: 2-1: Dates of Wahleach Project WUP TOR Submissions and Approvals by the Comptroller of Water Rights**

Monitoring Program & Physical Works TOR	Order Clause	Original ToR Submission		Most Recent ToR Resubmission	
		Date Submitted	Date Approved	Date Submitted	Date Approved
WAHMON-1 Lower Jones Creek Fish Productivity Indices	Schedule B.1.a	Aug 24, 2005	Sep 27, 2005	Feb 24, 2011	Oct 01, 2012
WAHMON-2 Channel Stability Assessment	Schedule B.1.a	Aug 24, 2005	Sep 27, 2005	Feb 24, 2011	Oct 01, 2012
WAHMON-3 Herring Island Sidechannel Chum Spawning Success Monitoring	Schedule B.1.b	Aug 24, 2005	Sep 27, 2005	Feb 24, 2011	Oct 01, 2012
WAHWORKS-1 Boulder Creek Diversion Bypass	Schedule A.2.a.ii	Aug 24, 2005	Oct 28, 2005	Feb 24, 2011	Oct 01, 2012
		Jul 16, 2007	Jul 26, 2007		
WAHWORKS-2 Wahleach Reservoir Fertilization Program	Schedule C	Aug 24, 2005	Oct 28, 2005	Feb 09, 2012	Feb 10, 2012
WAHWORKS-3 Lower Wahleach (Jones) Creek Channel Enhancement Project	Schedule D	Jun 15, 2006	Aug 02, 2006		

### **3 Schedule**

The following table (Table 3-1) outlines the current schedule for the monitoring programs and physical works being delivered for the Wahleach Project WUP.

**Table 3-1: Table of WUP Schedule**

Study/Physical Work	Component	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
		WLR YR1	WLR YR2	WLR YR3	WLR YR4	WLR YR5	WLR YR6 Interim Review <sup>4</sup>	WLR YR7	WLR YR8	WLR YR9	WLR YR10	WLR YR11
WAHMON-1 Lower Jones Creek Fish Productivity Indices	Fry Outmigration Assessment	✓	✓	✓	✓	✓	X	✓	X	✓	X	FR
	Smolt Outmigration Assessment	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>	X	X	X	X	X	
	Adult Salmon Escapement	✓	✓	✓	✓	✓	X	✓	X	✓	X	
	Adult Steelhead Escapement	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>	X	X	X	X	X	
WAHMON-2 Channel Stability Assessment	✓		✓		✓		✓		✓		FR	
WAHMON-3 Herring Island Sidechannel Chum Spawning Success Monitoring	Behaviour Assessments	✓	✓	✓	✓	✓	X	X	X	X	X	FR
	Stranding Assessments	✓	✓	✓	✓	✓	X	X	X	X	X	
	Water level fluctuation monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	■	
WAHWORKS-1 Boulder Creek Diversion Upgrade	Temporary Upgrade	✓	✓	✓ <sup>2</sup>	□	□	X	X	X	X	X	
	Final Upgrade						X					
WAHWORKS-2 Wahleach Reservoir Fertilization	Fertilization and Basic Monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	■	FR
	Hydroacoustic Monitoring		✓	✓	✓	✓	✓	✓	✓	✓	■	
WAHWORKS-3 Lower Wahleach Creek Channel Enhancement Project		DEL <sup>3</sup>	✓	✓	✓	□	□	□	□	□	□	

1. Per the terms of reference for these study components, no steelhead or smolt studies will be conducted until confirmation of either populations in Lower Jones Creek is provided through fry and salmon study components.

2. The works completed in September 2005 were undermined during a storm event November 2006; replacement complete in September 2007.

3. The enhancement project delay to 2006 was approved by the Water Comptroller 28 October 2005. The enhancement works terms of reference was given leave to commence 2 August 2006.

4. Interim 5 year review occurs in year 6 given requirement to consider results of a full 5 years of monitoring with sufficient reporting period.

Legend: □ = Project timing subject to change according to maintenance schedule

■ = Project to be undertaken/initiated in identified year

✓ = Project field work/data collection is complete for the year

X = Project field work/data collection discontinued based on outcome of interim

FR = Final Reporting planned for the project

#### **4 Monitoring Programs and Physical Works Terms of Reference**

The Monitoring Programs and Physical Works being implemented under the Wahleach Project WUP are described in TOR. These TOR and the reports for work completed to date can be found here:

[http://www.bchydro.com/about/sustainability/conservation/water\\_use\\_planning/lower\\_mainland/wahleach.html](http://www.bchydro.com/about/sustainability/conservation/water_use_planning/lower_mainland/wahleach.html)

#### **5 Summary of Monitoring Programs**

##### **5.1 WAHMON-1 Lower Jones Creek Fish Productivity Indices**

###### **5.1.1 Status**

This monitoring program was initiated in 2005 and will be completed in 2014. No report is attached. Since 2010, data collection has been occurring in odd (Pink Salmon) years only. The project report for the 2011/12 season was submitted with last year's annual report. Data collection for 2013 is still underway and the next project report for the 2013/14 season will be included with next year's annual report. The submission of the 2013/14 project report is expected to conclude the requirements for this project.

##### **5.2 WAHMON-2 Channel Stability Assessment**

###### **5.2.1 Status**

This monitoring program was initiated in 2005 and field work will be carried out until the summer of 2014. No report is attached. The latest report deliverable was the December 2011 project report that was submitted with last year's annual report. The next scheduled project report is expected in September 2014 and will be included in next year's annual report. The final project reporting deliverable that will conclude this project is expected in September 2015 and will be submitted with the subsequent annual report.

##### **5.3 WAHMON-3 Herrling Island Sidechannel Chum Spawning Success Monitoring**

###### **5.3.1 Status**

This monitoring program was initiated in 2005 and was completed in 2010 based on the outcome of the interim review. However, annual Herrling Sidechannel hydrometric data collection will continue through to 2015 to monitor Herrling Sidechannel water level fluctuation in response to both Wahleach Generating Station and Fraser River discharge. Annual summary reports of this continued data collection have not been submitted with annual reports to date. An overall summary report will be submitted following conclusion of this project in 2015.

## **6 Summary of Physical Works**

### **6.1 WAHWORKS-1 Boulder Creek Diversion Bypass**

#### **6.1.1 Status**

This physical works was initiated in August 2005 and was completed in 2010 based on outcome of interim review. No report is attached to this annual report.

### **6.2 WAHWORKS-2 Wahleach Reservoir Fertilization Program**

#### **6.2.1 Status**

This physical works was initiated in 2005 and will be carried out until 2014. The 2012 project report is attached and the next project report for 2013 will be included with next year's annual report. The final 2014 project report is expected to be submitted with the 2015 annual report and will conclude the requirements for this project.

### **6.3 WAHWORKS-3 Lower Wahleach Creek Enhancement Channel**

#### **6.3.1 Status**

This physical works was initiated in 2006 and maintenance continued to 2009. No reporting has been provided since 2007 when the construction as-built report was submitted.

In the summer of 2013, BC Hydro visited the site with DFO and concluded that no further maintenance of the enhancement channel is warranted given the repeated and substantial infilling of this constructed channel, the significant annual bed-load movement in Lower Wahleach Creek and associated deposition at this location. As a result, no further work is being planned for this project.

## **7 Monitoring Programs and Physical Works Costs**

The following table summarizes the Wahleach Project WUP monitoring programs and physical works costs approved by the Comptroller and the Actual Costs to January 31, 2014.

**Table 7-1: Wahleach Project WUP Monitoring Programs and Physical Works Costs**

Monitoring Programs	Costs approved by CWR	Life to Date Actuals (LTD)	Estimated to Complete (Forecast)	Total Forecast (LTD and Forecast)	Variance Total to Approved	Explanation	Corrective Action
<b>Wahleach WUP Annual Report</b>	\$13,140	\$12,089	\$3,950	\$16,040	(\$2,900)	Time required for preparing annual reports was underestimated.	Resubmission is required.
<b>WAHMOM-1 Lower Jones Creek Fish Productivity Indices</b>	\$1,335,486	\$424,772	\$74,192	\$498,964	\$836,522	Efficiencies found due to outcome of interim review	
WAHM01A Fish Productivity Ind - ONR DM	\$147,986	\$44,517	\$5,592	\$50,108	\$97,878		
WAHM01A Fish Productivity Ind - ONR Imp	\$1,187,500	\$380,256	\$68,600	\$448,856	\$738,644		
<b>WAHMOM-2 Channel Stability Assessment</b>	\$227,278	\$130,829	\$36,629	\$167,458	\$59,820	Efficiencies found due to outcome of interim review	
WAHM02A Channel Stability Ass - ONR DM	\$74,678	\$19,295	\$5,610	\$24,905	\$49,773		
WAHM02A Channel Stability Ass - ONR Imp	\$152,600	\$111,534	\$31,019	\$142,553	\$10,047		
<b>WAHMOM-3 Herrling Island Sidechannel Chum Spawning Success Monitoring</b>	\$479,514	\$274,390	\$49,212	\$323,602	\$155,912	Efficiencies found due to outcome of interim review	
WAHM03A Herrling Island Side - ONR DM	\$141,814	\$37,008	\$6,818	\$43,827	\$97,987		
WAHM03A Herrling Island Side - ONR Imp	\$337,700	\$237,381	\$42,394	\$279,775	\$57,925		
<b>WAHWORKS-1 Boulder Creek Diversion Bypass</b>	\$1,330,034	\$289,031	\$0	\$289,031	\$1,041,003	Efficiencies found due to outcome of interim review	
WAHW01A Boulder Cr Flow Byp - ONR DM	\$265,918	\$40,612	\$0	\$40,612	\$225,306		
WAHW01A Boulder Cr Flow Byp - ONR Imp	\$283,116	\$179,728	\$0	\$179,728	\$103,388		
WAHW01A Boulder Cr Flow Byp - CAP Imp	\$781,000	\$68,692	\$0	\$68,692	\$712,308		
<b>WAHWORKS-2 Wahleach Reservoir Fertilization Program</b>	\$1,145,052	\$964,036	\$149,068	\$1,113,104	\$31,948	Efficiencies found due to outcome of interim review	
WAHW02A Fertilization Progr - ONR DM	\$54,058	\$35,436	\$7,829	\$43,265	\$10,793		
WAHW02A Fertilization Progr - ONR Imp	\$1,090,994	\$928,600	\$141,239	\$1,069,839	\$21,155		
<b>WAHWORKS-3 Lower Wahleach (Jones) Creek Channel Enhancement Project</b>	\$241,609	\$104,974	\$1,936	\$106,910	\$134,699	Efficiencies found due to outcome of interim review	
WAHW03A Lower WAH Channel - ONR DM	\$67,659	\$24,946	\$1,936	\$26,882	\$40,777		
WAHW03A Lower WAH Channel - ONR Imp	\$173,950	\$80,028	\$0	\$80,028	\$93,922		
<b>OR - Ordered Remissible</b>							
<b>ONR - Ordered Non-Remissible</b>							

\* Red values in parentheses denote overage.